

**Health Priority: Existing, Emerging, and Re-emerging Communicable Diseases**  
**Objective 4: Antibiotic and Antimicrobial Resistance**

**Long-term (2010) Subcommittee Outcome Objective:** Ensure that the use of antibiotics and antimicrobials is appropriate.

Inputs	Outputs		Outcomes		
	Activities	Participation/ Reach	Short-term 2002-2004	Medium-term 2005-2007	Long-term 2008-2010
<p>Time and effort of state public health staff.</p> <p>State funding of survey research costs to assess current antibiotic use practices in health care delivery and food animal husbandry.</p> <p>State funding of management information systems and laboratory capacity adequate to conduct surveillance and assessment of antibiotic resistance occurring in health care delivery and agricultural settings.</p> <p>An adequate statutory and legal base for antibiotic use control activities.</p> <p>The cooperative commitment of private health care providers and partner organiza-</p>	<p>The Division of Public Health and its partner organizations will conduct a statewide survey and assessment of existing surveillance and monitoring activities for pathogens resistant to antibiotics by health care facilities and laboratories, and will identify critical gaps, if any, which exist in the present system.</p> <p>The Division of Public Health and the State Laboratory of Hygiene will develop a program of technical assistance and proficiency testing for clinical laboratories doing antibiotic susceptibility analyses to ensure the accuracy and reliability of that testing.</p> <p>The Division of Public Health and its partner organizations will conduct a statewide survey and assessment of actual practices in uses of antibiotics in health care facilities consistent with established standards of practice.</p> <p>The Division of Public Health will employ or assign and support one or more dedicated personnel</p>	<p>Division of Public Health and State Lab of Hygiene</p> <p>Wisconsin Association of Homes and Services for the Aging</p> <p>Wisconsin Association of Health Plans, the State Medical Society of Wisconsin, the Pharmacy Society of Wisconsin, the major health systems and multi-specialty medical clinics in Wisconsin, the Catholic Health Association of Wisconsin, the University of Wisconsin Medical School</p> <p>Hospital and clinical laboratories</p> <p>Medical group practices, institutional infection control practitioners, medical infectious disease</p>	<p>By October 1, 2003, a coordinated state surveillance plan for monitoring patterns of antimicrobial resistance in microorganisms that pose a threat to public health, will be developed, adopted by the Division of Public Health, and implemented.</p> <p>By December 31, 2003, 90% of Wisconsin health care facilities will have guidelines and policies reflecting accepted standards of practice, to curtail inappropriate antibiotic usage.</p>	<p>By January 31, 2005, 100% of Wisconsin health care facilities will have infection control policies and procedures reflecting accepted standards of practice, to address prevention of transmission of antibiotic resistant infections within their facilities.</p> <p>By March 31, 2006, the Department of Health and Family Services will enter into a written agreement with the Department of Agriculture, Trade, and Consumer Protection and the Department of Natural Resources to establish a joint interagency initiative to monitor and control the transmission of antimicrobial resistant disease pathogens to humans through food or water.</p> <p>By March 31, 2006, Wisconsin Citizens will demonstrate on health status surveys, an understanding of the appropriate and inappropriate uses of antibiotics in</p>	<p>All commercial meat and other animal food products for human consumption sold in Wisconsin will have legal standards for unacceptable antibiotic residues, and there will be an ongoing testing and surveillance program of animal food products for antibiotic residues.</p>

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<p>tions to actively participate in antibiotic use and best practice activities.</p>	<p>positions under the direction of the Chief Medical Officer and State Epidemiologist for Communicable Diseases, to provide liaison and technical assistance to appropriate health care facilities on avoidance and control of antibiotic resistance in their institutions.</p> <p>The Division of Public Health will enlist the Wisconsin Health and Hospital Association, The Wisconsin Association of Homes and Services for the Aging, Wisconsin Association of Health Plans, the State Medical Society of Wisconsin, the Pharmacy Society of Wisconsin, the major health systems and multi-specialty medical clinics in Wisconsin, the Catholic Health Association of Wisconsin, the University of Wisconsin Medical School, the Medical College of Wisconsin, and the Wisconsin chapters of the appropriate medical specialty academies, in an initiative to develop and promote a statewide surveillance plan and standards of practice for use of antibiotics and antimicrobials in the delivery of health care.</p> <p>The Division of Public Health and State Laboratory of Hygiene will jointly develop the expanded capacity</p>	<p>specialists.</p> <p>The Medical College of Wisconsin, the Wisconsin Dental Association</p> <p>The Wisconsin chapters of the appropriate medical specialty academies</p>		<p>medical treatment, and of antimicrobials in personal and domestic hygiene.</p> <p>By January 31, 2007, 95% of antibiotic prescriptions for selected conditions, including otitis media and respiratory infection will be written only after the presence of a bacterial pathogen has been confirmed by laboratory analysis.</p>	

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	<p>to electronically gather, use, and pool existing data on antibiotic resistance from hospitals, laboratories, and medical practice groups.</p> <p>The Division of Public Health and the State Laboratory of Hygiene will establish an initiative to promote the use of rapid bacterial diagnostic testing methods to guide antibiotic prescribing practices in outpatient treatment by clinicians of acute infectious diseases.</p> <p>The Division of Public Health will convene staff and support a state workgroup of health facility infection control practitioners, physicians, and laboratorians with expertise in the field of infectious diseases and antibiotic resistance, to periodically meet to review the scientific literature in this area, and to issue recommendations and information briefs to state health care providers.</p> <p>The Division of Public Health will assign a professional with expertise in infection control and electronic data management to serve as liaison with the State Laboratory of Hygiene and staff to the workgroup for activities shown below.</p>				

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	<p>The Division of Public Health, the State Laboratory of Hygiene, and Department of Agriculture, Trade, and Consumer Protection will develop a sampling and sentinel surveillance program to test meat and other animal food samples from retail grocery and restaurant food establishments for antibiotic residues.</p> <p>The Division of Public Health, the State Laboratory of Hygiene, and Department of Natural Resources will develop a sampling and sentinel surveillance program to test groundwater and other environmental indicators of animal waste and agricultural runoff for the presence of antimicrobial resistant disease pathogens.</p> <p>The Department of Health and Family Services/Department of Agriculture, Trade, and Consumer Protection interagency workgroup will review the scientific literature on potential human health problems from the addition of antibiotics to food animal feeds; and to develop state policies, and if indicated, draft state legislation, to address identified problems.</p> <p>The Division of Public Health professional staff will research and prepare a briefing paper for the Department of Health and Family Services Secretary and the Legislature on the costs and benefits</p>				

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	<p>of controlling antibiotic use in animal feeds and will develop a sampling and sentinel surveillance program to test groundwater and other environmental indicators of animal waste and agricultural runoff for the presence of antimicrobial resistant disease pathogens.</p> <p>The Department of Health and Family Services/Department of Agriculture, Trade, and Consumer Protection interagency workgroup, will review the scientific literature on potential human health problems from the addition of antibiotics to food animal feeds; and to develop state policies, and if indicated, draft state legislation to address identified problems.</p> <p>The Division of Public Health professional staff will research and prepare a briefing paper for the Department of Health and Family Services Secretary, and the Legislature, on the costs and benefits of controlling antibiotic use in animal feeds.</p>				

## Health Priority: Existing, Emerging, and Re-emerging Communicable Diseases

### Objective 4: Antibiotic and Antimicrobial Resistance

#### Long-term (2010) Subcommittee Outcome Objective:

Ensure that the use of antibiotics and antimicrobials is appropriate.

Wisconsin Baseline	Wisconsin Sources and Year
24% (60/255) of invasive pneumococcal isolates are resistant or intermediate resistant to penicillin	2001 – Wisconsin Antibiotic Resistance Report
12.9% (33/255) of invasive pneumococcal isolates are multi-drug (penicillin and >2 non-beta lactam antibiotics) resistant	2001 – Wisconsin Antibiotic Resistance Report

Federal/National Baseline	Federal/National Sources and Year
0% of Salmonella isolates from humans are resistant to fluoroquinolones	1997 – National Antimicrobial Resistance Monitoring System
0% of isolates are resistant to third-generation cephalosporins	1997 – National Antimicrobial Resistance Monitoring System
3% of isolates are resistant to Gentamicin	1997 – National Antimicrobial Resistance Monitoring System
18% of isolates are resistant to Ampicillin	1997 – National Antimicrobial Resistance Monitoring System
150 daily doses of antimicrobials per 1000 patient days were used among intensive care unit patients	1995 – National Nosocomial Infections Surveillance System (NNIS)
17.6% of invasive pneumococcal isolates are penicillin resistant	2000 – Active Bacterial Core Surveillance
26% of non-Typhi Salmonella isolates and 49% of Salmonella Typhimurium isolates were resistant to one or more antimicrobial agents. 28% of S. Typhi isolates exhibited multi-drug resistance	1999 – National Antimicrobial Resistance Monitoring System (NARMS)
91% of Shigella isolates are resistant to one or more antimicrobial agents, and 65% are resistant to two or more agents	1999 - National Antimicrobial Resistance Monitoring System
10% of E. coli isolates are resistant to one or more antimicrobial agents, and 4% are resistant to two or more agents	1999 - National Antimicrobial Resistance Monitoring System
54% of Campylobacter isolates are resistant to one or more antimicrobial agents, and 20% are resistant to two or more agents	1999 - National Antimicrobial Resistance Monitoring System

Related USDHHS Healthy People 2010 Objectives			
Chapter	Goal	Objective Number	Objective Statement
10-Food Safety	Reduce foodborne illnesses.	10-3	Prevent an increase in the proportion of isolates of Salmonella species from humans and from animals at slaughter, that are resistant to antimicrobial drugs

Related USDHHS Healthy People 2010 Objectives			
Chapter	Goal	Objective Number	Objective Statement
14-Immunization and Infectious Diseases	Prevent disease, disability and death from infectious diseases, including vaccine-preventable diseases	14-21	Reduce antimicrobial use among intensive care unit patients

Definitions	
Term	Definition
None identified.	

### Rationale:

Resistance of infectious disease pathogens to antibiotics and antimicrobials is a growing public health problem, which is tied both to their excessive and inappropriate uses in human health care and hygiene applications, and also to their excessive and inappropriate uses in food animal husbandry. Drug resistant disease organisms are a public health problem of the industrialized world as well as of developing countries. This is a problem that significantly increases not only the risks from communicable diseases, but also the costs associated with treating them. Unless antimicrobial resistance problems are detected as they emerge, and rapid effective actions are taken to address and contain them, the public health system will be confronted with diseases which were previously treatable and controllable and no longer are. Furthermore, the health care delivery system will essentially revert to the treatment capabilities available to it in the pre-antibiotic era. Diseases from drug resistant pathogens are also increasingly being transmitted in community as well as health care settings and are a particular threat to certain populations, e.g., children, the elderly, and persons with compromised immune systems. Because of the complexity of the drug resistance problem, it will require a broad-based and comprehensive plan to address it.

### Outcomes:

#### Short-term Outcome Objectives (2002-2004)

- By October 1, 2003, a coordinated state surveillance plan for monitoring patterns of antimicrobial resistance in microorganisms that pose a threat to public health, will be developed, adopted by the Division of Public Health, and implemented. The plan will specify activities to be conducted at state and local levels; define the roles of participants; promote the use of standardized methods; and provide for timely dissemination of data to interested parties, e.g., public health officials, clinicians, and researchers. Needed core capacities at state and local levels will be defined and supported. The plan will coordinate, integrate, and build on existing disease surveillance infrastructure. The plan will specifically address the need to ensure the quality and reliability of drug susceptibility testing procedures and resultant data and measures to improve the surveillance for antibiotic resistance in agricultural settings. All surveillance activities will be conducted with respect for patient and institutional confidentiality.
- By December 31, 2003, 90% of Wisconsin health care facilities will have guidelines and policies reflecting accepted standards of practice, to curtail inappropriate antibiotic usage.

### Inputs:

- Time and effort of state public health staff.

- State funding of survey research costs to assess current antibiotic use practices in health care delivery and food animal husbandry.
- State funding of management information systems and laboratory capacity adequate to conduct surveillance and assessment of antibiotic resistance occurring in health care delivery and agricultural settings.
- An adequate statutory and legal base for antibiotic use control activities.
- The cooperative commitment of private health care providers and partner organizations to actively participate in antibiotic use and best practice activities.

### **Outputs:**

#### Activities:

- The Division of Public Health and its partner organizations will conduct a statewide assessment of existing surveillance and monitoring activities for pathogens resistant to antibiotics, and identify critical gaps.
- The Division of Public Health and the State Laboratory of Hygiene will develop a program of technical assistance and proficiency testing for clinical laboratories doing antibiotic susceptibility analyses to ensure the accuracy and reliability of that testing.
- The Division of Public Health and its partner organizations will conduct a statewide survey and assessment of actual practices in uses of antibiotics in health care facilities consistent with established standards of practice.
- The Division of Public Health will employ or assign and support one or more dedicated personnel positions, under the direction of the Chief Medical Officer and State Epidemiologist for Communicable Diseases, to provide liaison and technical assistance to appropriate health care facilities on avoidance and control of antibiotic resistance in their institutions.
- The Division of Public Health will enlist the Wisconsin Health and Hospital Association, The Wisconsin Association of Homes and Services for the Aging, Wisconsin Association of Health Plans, the State Medical Society of Wisconsin, the Pharmacy Society of Wisconsin, the major health systems and multispecialty medical clinics in Wisconsin, the Catholic Health Association of Wisconsin, the UW Medical School, the Medical College of Wisconsin, and the Wisconsin chapters of the appropriate medical specialty academies, in an initiative to develop and promote a statewide surveillance plan and standards of practice for use of antibiotics and antimicrobials in the delivery of health care.

### **Medium-term Outcome Objectives (2005-2007)**

- By January 31, 2005, 100% of Wisconsin health care facilities will have infection control policies and procedures, reflecting accepted standards of practice, to address prevention of transmission of antibiotic resistant infections within their facilities.



- By March 31, 2006, the Department of Health and Family Services will enter into a written agreement with the Department of Agriculture, Trade and Consumer Protection and the Department of Natural Resources to establish a joint interagency initiative to monitor and control the transmission of antimicrobial resistant disease pathogens to humans through food or water.
- By March 31, 2006, Wisconsin Citizens will demonstrate on health status surveys, an understanding of the appropriate and inappropriate uses of antibiotics in medical treatment, and of antimicrobials in personal and domestic hygiene.
- By January 31, 2007, 95% of antibiotic prescriptions for selected conditions, including otitis media and respiratory infection, will be written only after the presence of a bacterial pathogen has been confirmed by laboratory analysis.

#### **Inputs:**

- Time and effort of state public health staff.
- State funding of survey research costs to assess current antibiotic use practices in health care delivery.
- State funding of management information systems and laboratory capacity adequate to conduct surveillance and assessment of antibiotic resistance occurring in health care delivery.
- An adequate statutory and legal base for antibiotic use control activities.
- The cooperative commitment of private health care providers and partner organizations to actively participate in antibiotic use and best practice activities.

#### **Outputs:**

##### Activities:

- The Division of Public Health and State Laboratory of Hygiene will jointly develop the expanded capacity to electronically gather, use and pool existing data on antibiotic resistance from hospitals, laboratories and medical practice groups.
- The Division of Public Health and the State Laboratory of Hygiene will establish an initiative to promote the use of rapid bacterial diagnostic testing methods to guide antibiotic prescribing practices in outpatient treatment by clinicians of acute infectious diseases.
- Division of Public Health will convene, staff, and support a state workgroup of health facility infection control practitioners and physicians and laboratorians with expertise in the field of infectious diseases and antibiotic resistance to periodically meet to review the scientific literature in this area and to issue recommendations and information briefs to state health care providers.

- Division of Public Health will assign a professional with expertise in infection control and electronic data management to serve as liaison with the State Laboratory of Hygiene and staff to the workgroup for activities shown below.

**Long-term Outcome Objective (2008-2010):**

- All commercial meat and other animal food products for human consumption sold in Wisconsin will have legal standards for unacceptable antibiotic residues, and there will be an ongoing testing and surveillance program of animal food products for antibiotic residues.

**Inputs:**

- Time and effort of state public health staff.
- State funding of survey research costs to assess current antibiotic use practices in health care delivery.
- State funding of management information systems and laboratory capacity adequate to conduct surveillance and assessment of antibiotic resistance occurring in health care delivery.
- An adequate statutory and legal base for antibiotic use control activities.
- The cooperative commitment of private health care providers and partner organizations to actively participate in antibiotic use and best practice activities.

**Outputs:**

Activities:

- The Division of Public Health, the State Laboratory of Hygiene and Department of Agriculture, Trade, and Consumer Protection will develop a sampling and sentinel surveillance program to test meat and other animal food samples from retail grocery and restaurant food establishments, for antibiotic residues.
- The Division of Public Health, the State Laboratory of Hygiene, and Department of Natural Resources will develop a sampling and sentinel surveillance program to test groundwater and other environmental indicators of animal waste and agricultural runoff for the presence of antimicrobial resistant disease pathogens.
- The Department of Health and Family Services and Department of Agriculture, Trade, and Consumer Protection will establish an interagency workgroup to review the scientific literature on potential human health problems from addition of antibiotics to food animal feeds and to develop state policies, and if indicated draft state legislation to address identified problems.
- Division of Public Health professional staff will research and prepare a briefing paper for the Department of Health and Family Services Secretary and the Legislature, on the costs and benefits of controlling antibiotic use in animal feeds.

### Participation/Reach

- Division of Public Health and State Laboratory of Hygiene
- Wisconsin Association of Homes and Services for the Aging
- Wisconsin Association of Health Plans, the State Medical Society of Wisconsin, the Pharmacy Society of Wisconsin, the major health systems and multi-specialty medical clinics in Wisconsin, the Catholic Health Association of Wisconsin, the UW Medical School
- Hospital and Clinical Laboratories'
- Medical Group Practices, Institutional Infection Control Practitioners, Medical Infectious Disease Specialists
- The Medical College of Wisconsin
- Wisconsin Dental Association
- The Wisconsin chapters of the appropriate medical specialty academies
- Department of Health and Family Services Secretary
- Wisconsin Legislature

### **Evaluation and Measurement:**

Evaluation of this objective is tied closely to the desired outcome of establishing a surveillance system for monitoring and reporting the occurrence of human illness caused by drug resistant pathogens. Once this system is operational it will be used to establish evaluation baselines and assess trends in antibiotic resistance in clinical care delivery. Secondary evaluation measures will include behavioral measurement and assessment of best practices among prescribing practitioners, and of attitudes and knowledge regarding antibiotic and antimicrobial use among patient populations. A third set of indicators will be developed to monitor antibiotic use practices in food animal husbandry and the presence of antibiotic residues in appropriate food products.

### **Crosswalk to Other Health and System Priorities in Healthiest Wisconsin 2010**

The prevention of antibiotic resistance through the reduction in inappropriate uses antibiotics in food animal husbandry and production has significant commonality with the charge of the *Environmental and Occupational Health Hazards Subcommittee*. This will require coordination and linkage with that body and its recommendations, particularly with issues such as dealing with groundwater contamination with antibiotics and antibiotic resistant organisms from agricultural animal runoff, and testing wholesale and retail meats, eggs and dairy products for antibiotic residues. Surveillance for antibiotic resistant organisms in human and animal laboratory specimens will require significant investment in electronic reporting systems and information management technology, which will require coordination with and guidance from the *Integrated Electronic Data and Information Systems Subcommittee*, and the costs of this technology will have to be factored into the deliberations and recommendations of the *Equitable, Adequate and Stable Financing Subcommittee*. It is not anticipated that control of antimicrobial resistance will be a particularly labor intensive activity, but it will require a nucleus of professional staff for surveillance activities, public and professional information, technical assistance and administration. Program staffing needs will have to be factored into the overall human resource planning and recommendations of the *Sufficient, Competent Workforce Subcommittee*.

### **Significant Linkages to Wisconsin's 12 Essential Public Health Services**

*Monitor health status to identify community health problems:* The emergence and occurrence of antibiotic resistance in pathogens infecting the human populace and food animal supply is a diffuse and dynamic trend set, which requires close and continuous observation and supervision of both

human and animal health, in order to maintain the efficacy of currently available antimicrobial medications.

*Identify, investigate, control and prevent health problems and environmental health hazards in the community:* The control of antimicrobial resistance relies on a multi-pronged strategy, which addresses both individual attitudes and clinical treatment practices within the community, and animal husbandry and food production practices occurring in the rural sector.

*Educate the public about current and emerging health issues:* The issue of antimicrobial resistance in infectious disease pathogens is in large part a result of public misunderstanding of the proper use of antibiotics in common medical conditions such as upper respiratory and childhood ear infections. Physician prescription decisions are clearly influenced by the expectations and demands of their patients, so public health education, to ensure that those expectations and demands are reasonable and proper, will have a substantial positive influence on the problem.

*Promote community partnerships to identify and solve health problems:* A comprehensive effort to attack the problem of antibiotic resistance will require commitment and participation from a number of key stakeholders, including medical practitioners, along with their affiliated organizations and associations, and clinical education institutions; food animal producers, processors and retailers; and the general public as healthcare consumers.

### **Connection to the Three Overarching Goals of Healthiest Wisconsin 2010**

*Protect and Promote Health for All:* The continuing availability of a range of antibiotics which effectively and reliably can treat infectious diseases, not only benefits the individual infected patient, but also substantially reduces the risks of disease transmission to others.

*Eliminate Health Disparities:* If/when common and readily available drugs are no longer serviceable in the treatment of communicable diseases, the remaining formulary of uncommon and expensive drugs will only be available to a few patients and their clinicians.

*Transform Wisconsin's Public Health System:* The control and elimination of antimicrobial resistance in disease pathogens is an enormously complex issue, which will involve the need for closely coordinated effort by a number of different sectors within society, and subdivisions and levels of government. However, the effort must be led by the public health system.

### **Key Interventions and/or Strategies Planned:**

- Reduce the excessive and inappropriate uses of antibiotics and antimicrobials in medical care delivery.
- Reduce the inappropriate uses of antimicrobial over the counter products in home and personal hygiene.
- Reduce the inappropriate uses of antibiotics in food animal production.

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